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INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 6 : F03B 17/00 | A2

(11) International Publication Number: **WO 99/58850**

(43) International Publication Date: 18 November 1999 (18.11.99)

(21) International Application Number: PCT/SI99/00011

(22) International Filing Date: 10 May 1999 (10.05.99)

(30) Priority Data:
P-9800133 11 May 1998 (11.05.98) SI

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(74) Agent: PIPAN, Marjan; Kotnikova 5, 1000 Ljubljana (SI).

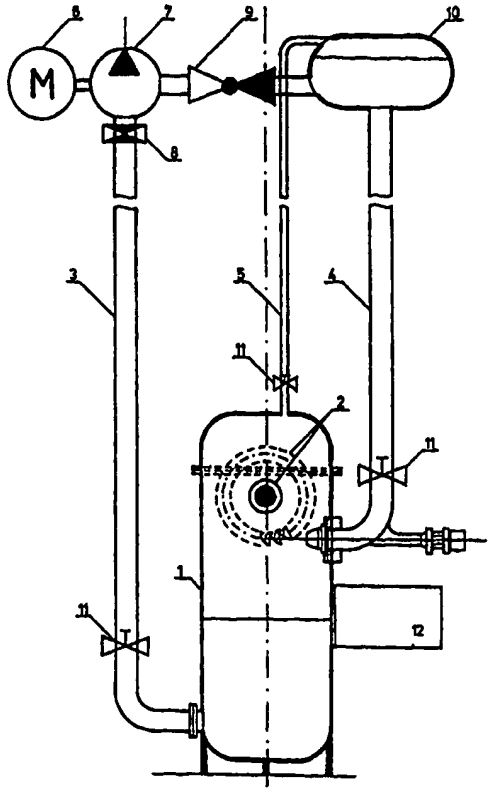
(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

Published
Without international search report and to be republished upon receipt of that report.

(54) Title: ENERGY PRODUCING DEVICE

(57) Abstract

The invention involves an energy regenerating hydroturbine equip ment, which by means of a regenerating accumulative hydroturbine hydraulic system provides for generation of mechanical energy. The energy regenerating hydroturbine equipment consists of the hydroaccumulator (1) with a built–in Pelton turbine (2), provided with a control system, linked by means of a pipe circulation and balancing assembly – consisting of a discharge pipe (3) with built–in closing pipe (11), system pressure balancing pipeline (5) and the inflow pipe (4) – with the upper assembly which consists of the control non–return valve (8), the electric motor (6) of the circulation pump, the circulation pump (7), the non–return valve (9) and the pressure balancing device (10) with a built–in separator.



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ENERGY PRODUCING DEVICE

The invention involves an energy regenerating hydroturbine equipment, which by means of a regenerating accumulative hydroturbine hydraulic system provides for generation of mechanical energy. The invention has been classified into class F 03 B 17/02 of the international patent classification.

The technical problem solved by the submitted invention is concerned with the design and production of an energy regenerating hydroturbine equipment which allows for generation of mechanical energy in a closed circuit without external effect and without intervention into nature in the terms of pollution, yet providing suffcient amount of energy.

The energy regenerating hydroturbine equipment referred to in this invention operates on the principle of Pascal law in the way that the hydroaccumulator and the circulation system are filled with a fluid (water), whereas the turbine and the part below the turbine are filled with an aeroide (nitrogen) whereof the pressure is speci ied by calculation. The Q flow is determined by the capacity of the circulation pump whereas the height H is determined by calculation with reference to the required

turbine power. The hydroaccumulator with a built-in Pelton turbine provided with a regulation and control system is linked by means of a pipe circulation and balancing assembly to the upper assembly whereof the essential part includes the circulation pump and the pressure balancing device with a built in separator.

The invention will be explained in detail on the basis of the concrete example and with reference to the figures whereof:

Figure 1 shows the schematic diagram of the equipment referred to in the invention;

Figure 2 shows the block diagram of the equipment operation.

As a matter of fact, the equipment referred to in the invention consists of three basic assemblies. The first, lower assembly consists of the hydroaccumulator 1 with a built-in Pelton turbine2 and with the corresponding regulation systems. The turbine axle, which provides full sealing at the hydroaccumulator outlet, bears a flywheel and a clutch, which enables further linking, e.g. to an electric dynamo. The whole assembly is located in a closed machine room and is controlled via a control board. This assembly is connected with another pipe circulation and balancing assembly which includes: the discharge pipe 3 with a builtin closing valve 11, the system pressure balancing pipeline 5 and the inflow pipe 4. The third, upper assembly consists of the control type

nonreturn valve 8, the circulation pump electric motor 6, the circulation pump 7, the non-return valve 9 and the pressure-balancing unit 10, provided with a built-in separator. The third assembly as a whole is mounted in a closed machine room which is connected with the control board by means of a cable line in the lower machine room which also houses the control console 12, providing for control of operation and sealing.

The energy regenerating hydroturbine equipment may be located anywhere where it is possible to achieve the calculated geodetic height H, such as at the foot of hills or mountains or in the buildings constructed in the height or in the depth.

The power calculation of the energy regenerating hydro turbine equipment shall be determined by the circulation pump flow capacity Q and by the height H. Thereby it is necessary to consider and to secure the pressure stability of the hydro accumulation device.

The ratio between the energy input required for pump and control system operation versus the acquired energy shall be 1:6, at the best 1:9.

The energy regenerating hydroturbine equipment constitutes a fully closed, autonomous energy regenerating system, independent of the environmental effect and it provides a suffcient quantity of non-polluted energy of reasonable price.

The system operates in the way that the hydroaccumulator 1 and the circulation system are filled with fluid (water). The turbine and the part

below the turbine are filled with an aeroide (nitrogen) whereof the pressure is specified by calculation. The Q flow is determined by the capacity of the circulation pump whereas the height H is determined by calculation with reference to the required turbine power. The water column in the discharge pipe 3 raises the accumulation pressure as far as the circulation pump 7. On the basis of the Pascal law on spreading of the external pressure in a fluid or with the fluid the same pressure is created in front of the pump 7 as well as in the accumulation basin 1. The circulation pump 7 of calculated flow takes the water in via the control valve 11 and increases the pressure by approximately H8 to 12 cm. This determines the direction of the closed circuit circulation. The water is directed via the non-return valve 9 into the equalizing vessel 10 - the separator and therefrom, due to the gravity law, along the inflow pipe 4 to the control system. The water jet from the nozzle emits kinetic energy to the Pelton turbine 2 driving system blades. Thereby the accumulation pressure drops to the upper water level in the hydroaccumulation vessel 1 and closes the circle of one circulation which continues due to the accumulation pressure and creates an energy regenerating hydroturbine system which provides for operation the equipment in question.

This invention solves the problem of lack of pollution-free energy and by application of small units provides for a permanent energy source wherever needed. At the same time it involves a minimum possible intervention into the nature.

The energy regenerating hydroturbine solves a lot of problems associated with generation of the pollution-free energy so much required by human beings. Since the system is fully independent of the environment (except for the initial start-up of pumps), the choice of the corresponding site is optional. The advantage of the system also lies in the fact that upon preliminary establishment of the required energy consumption it is possible to determine the power of the system and the number of systems required for the anticipated energy consumption. Through adaptation of the system to the environment the latter can be preserved in more or less original condition, along with permanent generation of pollution-free energy without any detrimental ecological effect. The energy regenerating hydroturbine equipment can be constructed with known mechanical assemblies and elements.

PATENT CLAIM

Energy regenerating hydroturbine equipment,

characterized in that

the hydroaccumulator (1) with a built-in Pelton turbine (2) is linked by means of a pipe circulation and balancing assembly - consisting of a discharge pipe (3) with built-in closing pipe (11), system pressure balancing pipeline (5) and the inflow pipe (4) - with the upper assembly which consists of the control non-return valve (8), the electric motor (6) of the circulation pump, the circulation pump (7), the non-return valve (9) and the pressure balancing device (10) with a built in separator.

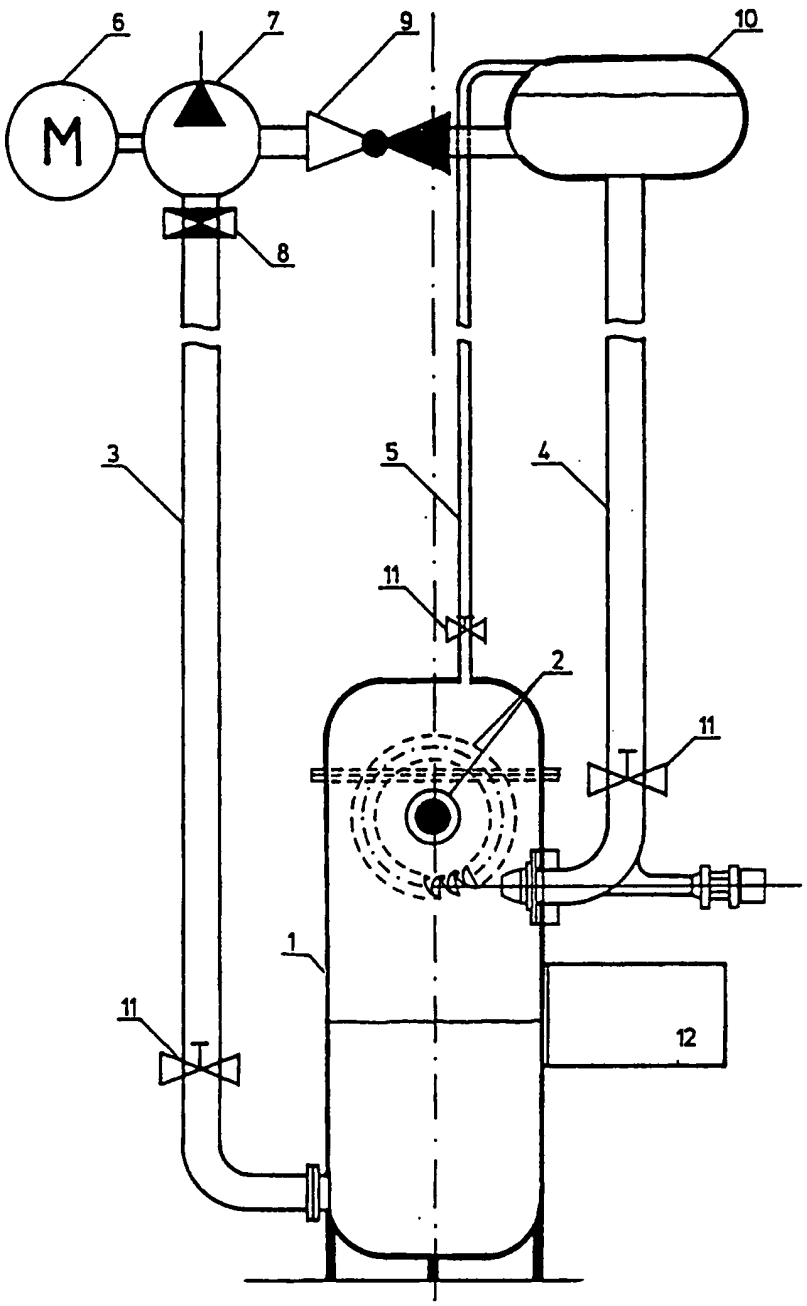

FIG. 1

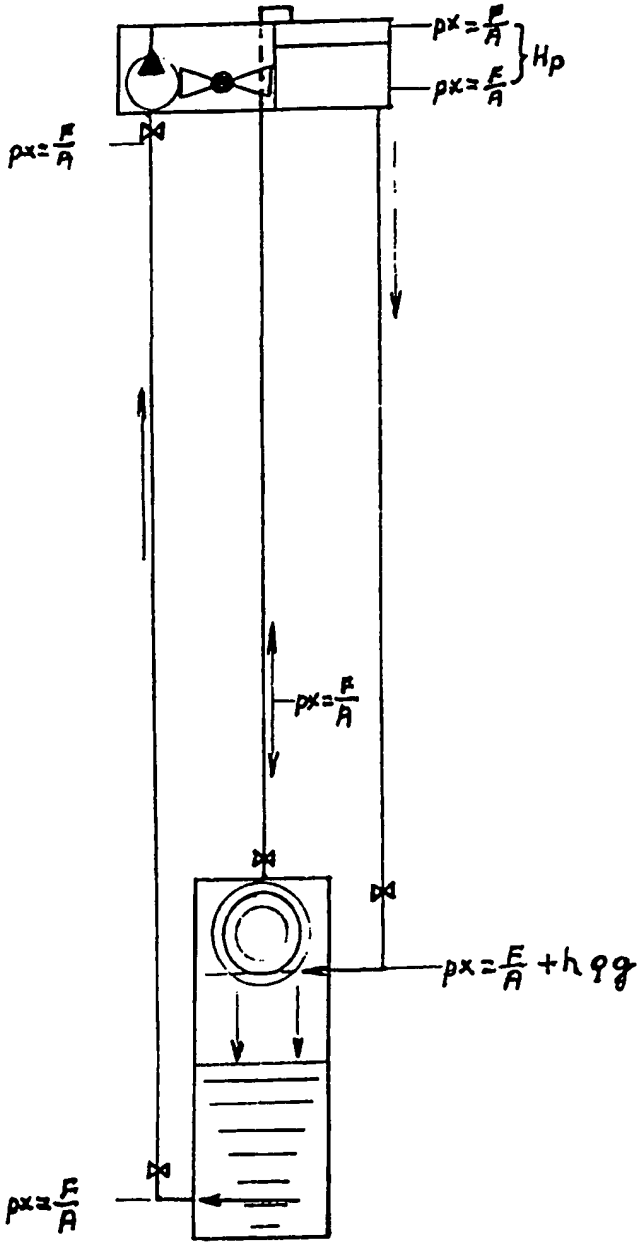
$p_x = \frac{F}{A}$
$p_x = \frac{F}{A}$
H_p
$p_x = \frac{F}{A}$
$p_x = \frac{F}{A}$
$p_x = \frac{F}{A} + h \rho g$
$p_x = \frac{F}{A}$

FIG. 2

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Published
With international search report.
Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.

(88) Date of publication of the international search report:
24 February 2000 (24.02.00)

(54) Title: ENERGY PRODUCING DEVICE

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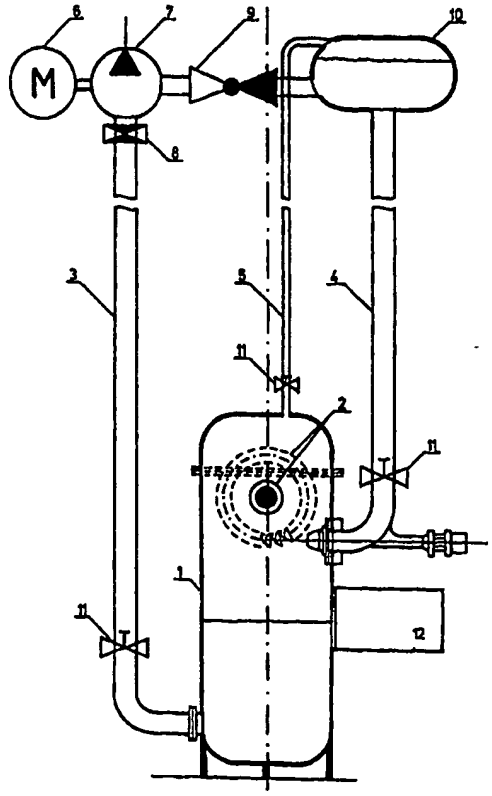

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INTERNATIONAL SEARCH REPORT

Inte nal Application No
PCT/SI 99/00011

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 F03B17/00

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IPC 6 F03B

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C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	DE 196 13 599 A (FUKAI KIYOTATSU) 14 November 1996 (1996-11-14) abstract , sentence 43 - sentence 65; figure 1	1
Y	US 4 767 938 A (BERVIG DALE R) 30 August 1988 (1988-08-30) column 2, line 45 - line 68 column 7, line 43 - line 56 figure 2	1
Y	US 3 991 563 A (PELIN CHARLES) 16 November 1976 (1976-11-16) abstract column 5, line 56 - line 60	1

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